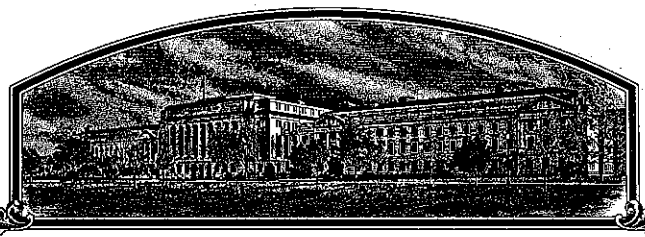

No. 9200253

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

The Ohio State University,
Ohio Agricultural Research and Development Center

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Freedom'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 31st *day of* May *in the year of our Lord one thousand nine hundred and* ninety-four.

Attest:

Kenneth A. Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Mike Espy

Secretary of Agriculture

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
The Ohio State University, Ohio Agricultural Research and Development Center

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
OH413

3. VARIETY NAME
Freedom

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
1680 Madison Avenue
Wooster, OH 44691

5. PHONE *(Include area code)*
216-263-3886

FOR OFFICIAL USE ONLY

PVPO NUMBER
9200253

FILING
Date: August 25, 1992
Time: 3:50 ☐ A.M. ☑ P.M.

FEES RECEIVED
Filing and Examination Fee: $ 2150.00
Date: August 24, 1992
Certificate Fee: $ 250.00
Date: April 18, 1994

6. GENUS AND SPECIES NAME
Triticum aestivum, L

7. FAMILY NAME *(Botanical)*
Graminae

8. CROP KIND NAME *(Common Name)*
Soft Red Winter Wheat

9. DATE OF DETERMINATION
6/28/90

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Agricultural Experiment Station

11. IF INCORPORATED, GIVE STATE OF INCORPORATION

12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Dr. H. N. Lafever
Agronomy Dept.
Ohio Agricultural Research & Development Center
1680 Madison Ave., Wooster, OH 44691
PHONE *(Include area code)*: 216-263-3886

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*
- a. [X] Exhibit A, Origin and Breeding History of the Variety.
- b. [X] Exhibit B, Novelty Statement.
- c. [X] Exhibit C, Objective Description of Variety.
- d. [X] Exhibit D, Additional Description of Variety.
- e. [X] Exhibit E, Statement of the Basis of Applicant's Ownership.
- f. [X] Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office (enclosed)
- g. [X] Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
[X] YES *(If "YES," answer items 16 and 17 below)* ☐ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
[X] YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
[X] FOUNDATION [X] REGISTERED [X] CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____ .)
[X] NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
[X] NO (Some seed under our control was distributed to other state seedstock organizations for increase (first on 8/27/91 to Mich.)

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
Howard N. Lafever	Breeder	6/30/92
James H Baun	Acting Director	7/15/92

Exhibit A

Origin and Breeding History of the Variety

1. Freedom (previously known as OH413) originated at The Ohio State University, Ohio Agricultural Research and Development Center from the cross: GR876/OH217, (OH217=Logan*3/3/Va63-52-12/Logan//Blueboy-F_2). The cross was made in 1980. Freedom was first selected as an F_3 plant in 1983. Fifty heads were reselected in F_7 in 1987 and progeny rows were examined for uniformity and yield through 1990. Its earlier experimental designation was 11880-10.

2. Breeder seed of Freedom consists of the progeny of 19 different F_7 plants bulked after harvest in the F_{10} generation in 1990 after the progeny appeared identical and true breeding in separate plots in 1988 through 1990. Seed was bulked after harvest in 1990 and further increased as breeder seed in 1990-91. Foundation generation seed is under production in 1991-92.

3. Freedom appears to be very uniform and homozygous as observed in the field in 1990, 1991, and 1992. This uniformity is to be expected with our purification and increase system.

4. Freedom appears to be very stable and true breeding as evidenced by various agronomic and pathological examinations conducted on the F_{10}-F_{12} generations in the special purification and increase nurseries.

5. Variants observed during the development of this variety were very few in number and of various, non recurring types, typical of breeding programs involving self-pollinated crops

6. This variety was selected for its high yielding ability, excellent straw strength, and excellent disease resistance. The variety possesses the 2BL/1RS translocation, the same translocation present in its parent, GR876.

Exhibit B

Novelty Statement and Botanical Description of the Variety

Freedom is an awnless cultivar, but like most soft red winter wheats, it possesses apical awnlets. Freedom appears most similar to Cardinal under normal field conditions in the Midwest, possessing very similar medium green foliage color and head color. Freedom and Cardinal possess apical awnlets of similar length. Spikelets of Freedom are slightly smaller than those of Cardinal and the heads are slightly denser for Freedom and slightly smaller. Freedom tends to possess 2-3 extra spikelets per head compared to Cardinal.

Freedom is a moderately early to mid-season cultivar and is moderately short, averaging 5 cm shorter and 2 days earlier than Cardinal in 18 tests from 1988-1990. The cultivar has exhibited very good straw strength in Ohio tests, being approximately equal to Cardinal and Dynasty. Winterhardiness of Freedom is excellent, equalling that of the best currently grown cultivars in Ohio tests.

Test weight of Freedom is relatively low, averaging approximately .5 lb/bu below that of Excel and slightly more than 1 lb/bu below that of Cardinal.

The USDA Soft Wheat Quality Laboratory, Wooster, Ohio in evaluations of samples of Freedom over a six-year period found Freedom to possess average milling quality and slightly below average baking quality.

Disease resistance of Freedom is excellent; the cultivar having shown no mildew (*Erysiphe graminis*) in trials over the past seven years. USDA Cereal Rut Laboratory tests involving several different races of *Puccinia recondita* and *Puccinia graminis* show Freedom to possess excellent resistance to these two pathogens. Ohio field tests have also verified these results. Freedom has also shown very good resistance to wheat spindle streak mosaic virus (WSSM). Freedom possesses resistance to races GP, A, C, E, and F of Hessian fly (*Mayetoila destructor*, Say) imparted by the H_3 gene.

Freedom also possesses good to excellent tolerance to acid soil being similar to Cardinal in this regard.

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
COMMODITIES SCIENTIFIC SUPPORT DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S): The Ohio State University, Ohio Agricultural Research and Development Center

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*):
1680 Madison Ave.
Wooster, OH 44691

FOR OFFICIAL USE ONLY

PVPO NUMBER: 9200253

VARIETY NAME OR TEMPORARY DESIGNATION: Freedom

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[2] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____
[1] 1 = SOFT 2 = HARD
3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[2][2][5] FIRST FLOWERING
[2][3][1] LAST FLOWERING

4. MATURITY (50% *Flowering*):
[ ][ ] NO. OF DAYS *EARLIER* THAN .....
[ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS
[ ][3] NO. OF DAYS *LATER* THAN .....
[1]

5. PLANT HEIGHT (*From soil level to top of head*):
[ ][9][1] CM. HIGH
[ ][ ] CM. TALLER THAN .....
[ ][3] CM. SHORTER THAN .....
[ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS
[1]

6. PLANT COLOR AT BOOTING (*See reverse*):
[2] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom: 1 = ABSENT 2 = PRESENT
[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[ ][4] NO. OF NODES (*Originating from node above ground*)
[2][2] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____
[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[1][2] MM. LEAF WIDTH (*First leaf below flag leaf*)
[2][9] CM. LEAF LENGTH (*First leaf below flag leaf*):

9200253

11. HEAD:

[2] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[2] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[2] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[8.3] CM. LENGTH [12] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[2-4] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[1] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT (occas. trace)

15. JUVENILE PLANT GROWTH HABIT:

[1] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[1] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[NA] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[7] MM. LENGTH [4] MM. WIDTH [35] GM. PER 1000 SEEDS

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA'
2 = 80% OR LESS OF KERNEL 'CHRIS'
3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT'
2 = 35% OR LESS OF KERNEL 'CHRIS'
3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[ ] STEM RUST (Races) See attached

[ ] LEAF RUST (Races) See attached

[0] STRIPE RUST (Races) _____

[0] LOOSE SMUT

[2] POWDERY MILDEW

[0] BUNT

[ ] OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY

[0] APHID (Bydv.)

[0] GREEN BUG

[0] CEREAL LEAF BEETLE

[ ] OTHER (Specify) _____

HESSIAN FLY RACES: [0] GP [2] A [1] B [2] C [1] D [1] E [2] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Cardinal	Seed size	GR 876
Leaf size	GR 876	Seed shape	GR 876
Leaf color	Cardinal	Coleoptile elongation	GR 876
Leaf carriage	Cardinal	Seedling pigmentation	Cardinal

RECEIVED AUG 24 1992 Plant Variety Protection Ofc.

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States. Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

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The Ohio State University
Ohio Agricultural Research and Development Center
Wooster, Ohio

RELEASE OF FREEDOM SOFT RED WINTER WHEAT

The Ohio State University, Ohio Agricultural Research and Development Center announces the release of 'Freedom' soft red winter wheat, a new, productive cultivar for Ohio and surrounding states.

Freedom (previously designated OH413) resulted from the cross: GR876/ OH217 (OH217 = Logan*3/3/Va 63-52-12/Logan//Blueboy-F_2). First selected in 1983 as an F_3 plant. Fifty heads were reselected in F_7 in 1987 and progeny rows were examined for uniformity and/or yield through 1990. Breeder seed consists of progeny of 19 different F_7 plants bulked after harvest in the F_{10} generation in 1990.

Freedom was first tested in Advanced Ohio Trials in 1986. At the end of the 1990 season it had been tested in 22 state-wide, drilled plot trials over a 5-year period. Freedom was also an entry in the Uniform Eastern Soft Red Winter Nursery in 1989 and 1990.

Freedom is a beardless, white chaffed cultivar. It is a medium short cultivar of medium maturity. Straw strength of Freedom appears equal to Cardinal and Dynasty. Winterhardiness of Freedom is excellent, being equal to Becker, Dynasty and Excel. Yields of Freedom have exceeded Becker and Cardinal by several bushels, but averaged only 0.6 and 0.7 bu/a above Dynasty and Excel, respectively, in 18 tests over a 3-year period. (See Tables 1-4 for additional data.)

The USDA Soft Wheat Quality Laboratory at Wooster, has reported Freedom to possess acceptable milling and baking quality based on tests over 6 years. Quality was considered to be average.

Freedom possesses excellent resistance to both leaf rust (*Puccinia recondita*) and powdery mildew (*Erisiphe graminis*) in field evaluations in Ohio. It is also highly resistant to wheat spindle streak mosaic virus (WSSM). It also appears resistant to all selected isolates of stem rust (*Puccinia graminis*) according to published 1990 Uniform Eastern Soft Red Winter Nursery results conducted by the USDA-ARS Cereal Rust Laboratory. In 1989 and 1990 Freedom exhibited few septoria leaf or glume blotch symptoms under field conditions in Ohio even though these diseases were severe both years in terms of overall nursery infections. Tests conducted by the USDA-ARS Hessian Fly Lab, Lafayette, IN indicate Freedom possesses only the H3 gene for Hessian fly resistance.

Freedom was so named in honor of the troops who participated in Operation Desert Storm as well as seeming appropriate in view of its relative freedom from disease; presumed to be largely due to its possessing the 1B/1R translocation from rye.

Application for Plant Variety Protection will be made for Freedom. The classes Foundation, Registered, and Certified will be allowed beyond Breeder seed. Breeder seed of Freedom will be maintained by The Ohio State University, Ohio Agricultural Research and Development Center, Wooster, OH, 44691.

Release of information to the general public regarding the name, release, performance or description of Freedom by those participating in the release may be made after August 1, 1991.

Freedom will be available as Breeder seed to other states for fall, 1991 seeding.

States interested in the increase and release of this new cultivar must notify Dr. H. N. Lafever, Agronomy Department, Ohio Agricultural Research and Development Center, Wooster, OH, 44691 in writing by August 15, 1991 indicating the quantity of Breeder seed desired. Pricing will be appropriate for this class of seed.

A royalty fee of $ 0.25 per bushel must be assessed and collected on the Registered and Certified class of seed of Freedom by states participating in release of this cultivar. Research and development fees collected by another state will be shared equally, with 50% retained by that state, if allowed by the Director, to be used for agronomic crop breeding research and development. The other 50% is to be returned to the Ohio Agricultural Research and Development Center. It is recommended that an additional $ .10 per bushel administrative fee be levied by participating states to cover the cost of collection, advertising, and protection of the cultivar in the state of collection. Contractual arrangements will be completed at a later date with those states participating in the release of Freedom.

James H. Brown

James H. Brown, Acting Director
The Ohio State University
Ohio Agricultural Research and
Development Center

July 18, 1991
Date

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Table 1. Comparison of yields of Freedom with currently grown cultivars in drilled plot trials, by years, Ohio.

Cultivar	1986 1 test	1987 3 tests	1988 6 tests	1989 6 tests	1990 6 tests	Summary Avg. 21 tests	Avg. 18 tests	Avg. 15 tests
Freedom	70.2	76.0	69.6	64.9	74.7	70.6	69.7	70.2
Becker	49.1	64.8	67.4	57.4	67.4	64.2	64.1	63.2
Caldwell	49.5	62.4	67.9	54.2	--	--	--	61.5
Cardinal	--	68.5	60.3	60.4	72.1	64.9	64.3	63.1
Dynasty	--	--	71.5	66.5	69.4	--	69.1	--
Excel	--	--	71.3	65.5	70.1	--	69.0	--
5% L.S.D.	4.5	5.7-6.9	3.0-N.S.	4.3-6.7	3.7-5.2			

Table 2. Comparative Agronomic performance of Freedom and currently grown cultivars in drilled plot trials, Ohio (average of 18 tests, 1988-90).

Cultivar	Winter Survival (%)	Pl. Ht. (in.)	Date Headed (May)	Lodging (%)	Test Wt. (lb/bu)
Freedom	96	36	25	8	54.9
Becker	96	33	26	3	55.9
Cardinal	91	38	27	7	56.2
Dynasty	96	38	25	8	57.7
Excel	96	36	26	2	55.5

Table 3. Comparative performance of Freedom and currently grown cultivars in miscellaneous Ohio tests.

Cultivar	H.F. Res. (Races)	% Mildew[1] 12 tests 5 yrs	WSSM[2] 4 tests 1 yr	Leaf Rust 4 tests 4 yrs	Al Tolerance Yield[3] 1 yr	Al Tolerance Score[4] 5 yrs	Quality - 6 yrs Milling	Quality - 6 yrs Baking
Freedom	A,C,F	0	2	0	---	4.8	C-	D
Becker	A,C,F	82	1	3MR	100	4.0	C	B-
Caldwell	A,B,E	29	4	0VR	100	6.3	--	--
Cardinal	A,C,F	33	2	1VR	100	4.8	A	B
Dynasty	None	13	1	2VR	43	6.5	B-	D
Excel	A,B,C,E,F	13	1	4VR	97	7.2	B-	C-

[1] Years or locations with no mildew present omitted from calculations.
[2] 0 = none to 9 = severe.
[3] Yield as a % of Seneca.
[4] 0 = very tolerant to 9 = sensitive.

Table 4. Summary of Regional Nursery data involving Freedom and currently grown cultivars in Ohio tests (4 tests).

Cultivar	Yield (bu/a) 1990 OARDC	1990 N.W.	1989 OARDC	1989 N.W.	Avg.	Avg. Date Headed (May)	Avg. Ht. (in.)	Avg. Lodging (%)	Avg. Survival (%)	Avg. Mildew (%)	H.F. Races E B L	Test Wt. (lb/bu)
Cardinal	74.1	73.4	52.0	53.5	63.3	28	39	20	90	32	R-S-S	53.2
Excel	71.8	70.6	51.5	64.9	64.7	27	36	17	92	16	R-R-S	52.2
Freedom	75.2	75.9	53.7	69.9	68.7	27	37	11	89	0	R-S-S	52.2
Wakefield	80.4	75.2	58.7	68.1	70.6	29	39	22	86	0	S-S-S	53.6
Caldwell	67.6	61.5	38.6	50.2	54.5	26	36	25	89	21	R-R-S	52.7
5% L.S.D.	5.6	6.0	9.4	11.4								

Seedling reaction of entries of the 1990 Uniform Eastern Soft Red Winter Wheat Performance Nursery to selected isolates of Puccinia graminis f. sp. tritici. (by D.V. McVey, USDA-ARS, Cereal Rust Laboratory, U. of MN., St. Paul, MN.)

No.	Name or Sel. No.	Reaction Produced by Isolates							Spec. Sr Gene
		68-41-73A HNLQ 17A	72-00-1370C QFBS 151	69-21-399 QSHS	72-25-639C RKQS 11-32	72-00-53A RTQQ	72-4-1A TNMH 153-2	74-21-1409A TNMK	
1	Knox 62	S	S	S	S	S	S	S	NONE
2	Cardinal	S	S	S	S	S	S	S	NONE
3	Caldwell	0	2=	S	S	0	0	2=	9a,17
4	OH 286	0	2=	2=	S	0;	0	S	7b,17
5	AR 26415	2=	2=	S	21N	2-	2	2-	+
6	OH 394	0	S	0,S	S	S	S,0;	S	5,seg 17,36?
7	KY 83-38	S	S	S	S	S	S	S	NONE
8	MO 10501	2=	2=	S	S	S	2=	2-	9a
9	ABI 85-81	0	1N	0	;1CN	0	;	;1CN	6,17,36
10	MO 11769	S	S	S	S	S	S	S	NONE
11	MO 11785	0	;	S	;,S	0	0	2	10,17,+
12	OH 413 (Freedom)	0	0;	0	0	0	0	0	+
13	VA 85-52-24	0	0	0	0	0	0	0	+
14	VA 85-52-34	;1N	;1N	S	;1N	1N	;1-N	;1CN	10,15,17
15	IL 84-3010	S,;1-N	S	S	S	S	S,;	S	seg 17
16	IL 84-3511	;1=N	23CN	S	S	S	;1N,S	S-	seg 17
17	PA 8457-1	2=	2=	S	S	S	2-	2-	5,9a
18	WI X1625-1-1	2-	2=	2	S	S	S	S	+
19	MD 75266-46	0,S	S	S	S	S	S	S	seg 5
20	C 86-33	0	0	0	0	0	0	0	+
21	CL 860426	0	1	0	;1	0	0	0	+
22	MD Blend	S	S	S	S	S	S	S	NONE
23	Susquehanna	0,S	S	S	S	S	S	S	seg 5
24	T 84-774	0	S,;	S	S	S	;	S	+
25	T 84-331	0	0	23	;1CN	0,S	0	0	6,10
26	79410D1-3-3-5-2-1	0	S	0	S	0	0	2=	17,36,+
27	8138I1-16-5-50	0	S	S	S	0	0	S	5,17
28	7942H1-20-8	0	S	S	S	0;,S	;,S	S	5,seg 17
29	ABI 86-91	0	2-1N	S	0	;1-N	S	S	5,10
30	ABI 86-55	0	0	S	0	;1-N	S	S	5,10
31	PSR-W71	0	S	S	S	0	0	S	17
32	PSR-W84	0	S	S	S	0	0	S	17
33	PSR-W89	0	S	S	S	0	0	S	17
34	IL 84-4046	2	2	S	S	S	2-	2-	9b
35	WI X1625-1-3	2	2-	2=	2	2-	S	S	+
36	WI X1923-1	0	2	23	S	S	2-	2	5,9a
37	VS 30409	0	S	S	S	0	0	S	17
38	VS 30557	S	S	S	S	S	S	S	NONE
39	C 86-24	;1-	-	S	S	-	;1-CN	2-CN	+
40	LB 63	0	2=	2-	2=	0	0	2=	17,24
41	AR 84-31-5	0	S	S	S	0	0	S	17

Seedling reaction of entries of the 1989-90 Uniform Eastern Soft Red Winter Wheat Performance Nursery to selected races of Puccinia recondita f. sp. tritici (by David Long, USDA, ARS, Cereal Rust Lab. Univ. of MN, St. Paul, MN).

#	Cultivar or line	Reactions produced by NA race										Postulated Lr genes
		TLGG[1]	MBGL	TBGL	CBGL	CBGB	DBBB	LBBQ	MFBL	MDBL	PBRG	PLML	
	Knox 62	3	3	3	3	3	3	3	3	3	3	3	0
	Cardinal	;	3	1c2	1c;	;	;1c	3	;1c-3	3;-1c	3	21c	+
	Caldwell	3;	3	3	3	3	;1c	3	3	3	1c;	1c2	+
	OH 286	3	3	3	3	3	;1c	3	3	3	3	3	+
	AR 26415	3	3	3	3	3	;	;2	;1	;1	3	1c1	11
	OH 394	;	;1c	;1c	;1c	;	;1	;	;	;1c	3	3	+
	KY 83-38	3;1c	3	3	3	3;	3;	3	3	3	3	3	+
	MO 10501	3	3	3	;	;	;1	;	3	3	3	3	1
	ABI 85-81	;	1c;	;1c1	;	;	;	;	1c2	;1c	21	1c;2	--[2]
0	MO 11769	3	3	3	;1c	;	;1c	;1c	;1c1	;1c1	3	21;	1,11
1	MO 11785	3-1c2	3-;	;1c-3	3;	3-;	3;	3;	3	3-1c;	1c3;	31c	+
2	OH 413 (Freedom)	;	;	;	;	;	;	;1c	3;	;	;	;	+
3	VA 85-52-24	;	3;	3;	3;	;	;	;	;	;	;	;1	10,11
4	VA 85-52-34	;	3	3	3	;	;	3	3	3	3	3	10
5	IL 84-3010	3	3	3	;	;-3	;-3	3	3	3	3	3	+
6	IL 84-3511	3	3	3	;	;3	;-3	3	3	3	3	3-;	+
7	PA 8457-1	3	;	;	;	;	;	;	;	;	;	3	9
8	WI X1625-1-1	3;	3	3	3	3	;	;	3	3	3	3	3
9	MD 75266-46	3	3	3	3	3	3	3	3	3	3	3	0
0	C 86-33	;	;	;	;c	;c	;c	;	;	;1c	;	;	--
1	CL 860426	3	3	3;	;1c	;1c2	;	;	;	;	3	;	1,3,11
2	MD Blend	;-3	3-;	-	3-;	;	;c	;	;	3	3	3	+
3	Susquehanna	;	3-;	3	3;	;	;	;	3-;	3-3;	3-3;	3	+
4	T 84-774	;	;1c	;1c1	;1c	;1c	;1c-3	;1c	;1c	;2c	3	3	+
5	T 84-331	3	;	3	;	;	;	;	;	;	;	;	2a,11
6	79410D1-3-3-5	;-2	3	3	3	;3	;	11c;	2	1+	;	;	+
7	8138I1-16-5-50	;1c3	3	31c	;1c	;1c	;1c2	;	3;	1c;-3	;1c	1c;	+
8	79424H1-20-8	;1c-3	3;	;	;1c	;3	;1c	;1c	;	2;	1c;-3	3-;	+
9	ABI 86-91	3	3	-	3	3	;	;1c	;1c	;	3;	;1c	11
0	ABI 86-55	3;	3	3	3	3	3-;	;-3	;	3;	3	;1c-3	+
1	PSR-W71	3-;1c	3	3	;	;	;	3	;-3	3	3	3	1
2	PSR-W84	;1c	3	3	1c;	31c;	;1c	;	;	;	;	;	+
3	PSR-W89	3	3	3	1c;	;	;	;2	;	;	3	;	1,11
4	IL 84-4046	3	;	3	;	;	;	;	;	;	;1	;-3	1,2a
5	WI X1625-1-3	1c2	3	3	3;	3;	;	-	3;	3	3	3	+
6	WI X1923-1	3	3	3	3	3	;	;	3	3	3	3	3
7	VS 30409	3	3	3-;	3	3	;1c	1+	3	3	3	3	+
8	VS 30557	;1c3	3	3	3	3;	31c	3;	3	3	2;-3	3;	+
9	C 86-24	;	-	;	;	;	-	-	-	;	;	-	--
0	LB 63	;	;	;	;	;	;	1c2	;-3	;	;	;	+
	AR 84-31-5	;	;1c	;	;	;	;	;	;	;	;	;	--

Single Lr genes tested - 1,2a,2c,3,3ka,9,10,11,16,17,18,24,26,30.

Virulence formula:

TLGG - Lr1,2a,2c,3,9,11,18
MBGL - Lr1,3,10,11
TBGL - Lr1,2a,2c,3,10,11
CBGL - Lr3,10,11
CBGB - Lr3,11
DBBB - Lr2c
LBBQ - Lr1,10,18
MFBL - Lr1,3,10,24,26
MDBL - Lr1,3,10,24
PBRG - Lr1,2c,3,3ka,11,18,30
PLML - Lr1,2c,3,3ka,9,10,30

[2] Broadly resistant in relation to test races.

Exhibit D

Additional Description of the Variety

Heads of Freedom are best described as dense (Item 11, Exhibit C), however, they are only moderately dense compared to many varieties described as dense.

Freedom is apically awnletted with tip awns measuring 20-35 mm in length.

Auricles of Freedom are typically free of anthocyanin, however, in some seasons anthocyanin in auricles will occur, especially at row ends.

Exhibit E

Statement of the Basis of Applicant's Ownership

The originating cross, early line increase and evaluation, selection, reselection, testing, purification, and final multiplication were all performed by the applicant breeder (Dr. H. N. Lafever) or his technical assistants on the property of The Ohio State University, Ohio Agricultural Research and Development Center utilizing funds provided for such research. The variety is intended for release as a public variety in the United States.